

AMENDMENTS TO THE CLAIMS

This listing of claims supersedes all prior versions and listings of claims in this application:

LISTING OF CLAIMS:

1-23. (Cancelled)

24. (Currently Amended) A mixer having a first input comprising a first frequency f_1 and a second input comprising a second frequency f_2 , said mixer comprising:

mixing means for mixing the first and second inputs to produce an output having an additive frequency component f_+ and a difference frequency component f_- , where:

$$f_+ = f_1 + f_2,$$

$$f_- = \text{absolute value } (f_1 - f_2); \text{ and}$$

an active inductive load comprising Field Effect Transistors (FET),
wherein said active inductive load is electrically connected to said mixing means and provides a variable load on said mixing means, wherein a base of one of said FETs is connected to two capacitors, and wherein said active inductive load further comprises a FET diode.

25. (Previously Presented) A mixer according to claim 24, wherein said FETs comprise MOSFETs.

26-27. (Cancelled)

28. (Currently Amended) A transceiver comprising:

a first adaptive amplifier having an output comprising a first frequency f_1 , said amplifier comprising amplification means and active matching means for providing active matching at an input and output of said amplification means;

a first mixer having a first input comprising the output of said adaptive amplifier and a second input comprising a reference signal having a reference frequency f_2 , said mixer comprising:

mixing means for mixing the first and second inputs to produce an output having an additive frequency component f_+ and a difference frequency component f_- , where:

$$f_+ = f_1 + f_2,$$

$$f_- = \text{absolute value } (f_1 - f_2), \text{ and}$$

active inductive load means for providing a variable load on said mixing means, wherein said means comprises a FET having a base connected to two capacitors, and wherein said means further comprise an FET diode; and

a first intermediate frequency amplifier,

wherein the output of said first mixer is input to said first intermediate frequency amplifier.

29. (Previously Presented) A transceiver according to claim 28, further comprising:

- a second intermediate frequency amplifier having an output;
- a limiter having an output comprising a third frequency f_3 , said limiter comprising a first active inductive load means for providing a variable load;
- a second mixer having a first input comprising the output of said limiter and a second input comprising the reference signal with frequency f_2 , said mixer comprising:
 - mixing means for mixing the first and second inputs to produce an output having an additive frequency component f_+ and a difference frequency component f_- , where:
$$f_+ = f_3 + f_2,$$
$$f_- = \text{absolute value } (f_3 - f_2), \text{ and}$$
 - a second active inductive load means for providing a variable load on said mixing means;

and

- a second adaptive amplifier comprising amplification means and active matching means for providing active matching at an input and output of said amplification means,

wherein the output of said second intermediate frequency amplifier is input to said limiter, and the output of said second mixer is input to said second adaptive amplifier.

30. (Original) A transceiver according to claim 29, further comprising:

- a doubler having an output and comprising:

doubling means for outputting an output frequency which is double an input frequency,
and

an active by-pass switch comprising a Field Effect Transistor (FET) and by-passing said doubling means upon application of a switching gate voltage to said FET causing the output frequency to be equal to the input frequency; and

a buffer amplifier outputting the reference signal having the reference frequency f_2 to said first and second mixers,

wherein the output of said doubler is input to said buffer amplifier.

31. (Currently Amended) A transceiver comprising:

an intermediate frequency amplifier having an output;

a limiter having an output comprising a first frequency f_1 , said limiter comprising a first active inductive load means for providing a variable load, wherein said first active inductive load comprises one FET having a base connected to two capacitors, and wherein said first active inductive load further comprises a FET diode;

a mixer having a first input comprising the output of said limiter and a second input comprising a reference frequency f_2 , said mixer comprising:

mixing means for mixing the first and second inputs to produce an output having an additive frequency component f_+ and a difference frequency component f_- , where:

$$f_+ = f_1 + f_2,$$

$f.=$ absolute value $(f_1 - f_2)$, and

a second active inductive load means for providing a variable load on said mixing means;
and

an adaptive amplifier comprising amplification means and active matching means for providing active matching at an input and output of said amplification means,

wherein the output of said intermediate frequency amplifier is input to said limiter, and the output of said mixer is input to said adaptive amplifier.

32. (Currently Amended) A mixer having a first input comprising a first frequency f_1 and a second input comprising a second frequency f_2 , said mixer comprising:

a mixer circuit which mixes the first and second inputs to produce an output having an additive frequency component f_+ and a difference frequency component $f.$, where:

$$f_+=f_1 + f_2,$$

$$f.= \text{absolute value } (f_1 - f_2); \text{ and}$$

an active inductive load comprising Field Effect Transistors (FET),
wherein said active inductive load is electrically connected to said mixer circuit and provides a variable load on said mixing means, and wherein a base of one of said FETs is connected to two capacitors, and wherein said active inductive load further comprises a FET diode.

33. (Previously Presented) A mixer according to claim 32, wherein said FETs comprise MOSFETs.

34-35. (Cancelled)

36. (Currently Amended) A transceiver comprising:

a first adaptive amplifier having an output comprising a first frequency f_1 , said amplifier comprising an amplifier circuit and an active matching circuit which provides active matching at an input and output of said amplifier circuit;

a first mixer having a first input comprising the output of said adaptive amplifier and a second input comprising a reference signal having a reference frequency f_2 , said mixer comprising:

a mixer circuit which mixes the first and second inputs to produce an output having an additive frequency component f_+ and a difference frequency component f_- , where:

$$f_+ = f_1 + f_2,$$

$$f_- = \text{absolute value } (f_1 - f_2), \text{ and}$$

an active inductive load which provides a variable load on said mixer circuit, wherein said active inductive load comprises one FET having a base connected to two capacitors, and wherein said active inductive load further comprises a FET diode; and

a first intermediate frequency amplifier,

wherein the output of said first mixer is input to said first intermediate frequency amplifier.

37. (Previously Presented) A transceiver according to claim 36, further comprising:

a second intermediate frequency amplifier having an output;

a limiter having an output comprising a third frequency f_3 , said limiter comprising a first active inductive load for providing a variable load;

a second mixer having a first input comprising the output of said limiter and a second input comprising the reference signal with frequency f_2 , said mixer comprising:

a mixer circuit which mixes the first and second inputs to produce an output having an additive frequency component f_+ and a difference frequency component f_- , where:

$$f_+ = f_3 + f_2,$$

$$f_- = \text{absolute value } (f_3 - f_2), \text{ and}$$

a second active inductive load which provides a variable load on said mixer circuit; and

a second adaptive amplifier comprising an amplifier circuit and an active matching circuit for providing active matching at an input and output of said amplifier circuit,

wherein the output of said second intermediate frequency amplifier is input to said limiter, and the output of said second mixer is input to said second adaptive amplifier.

38. (Previously Presented) A transceiver according to claim 37, further comprising:
a doubler having an output and comprising:
a doubler circuit which outputs an output frequency which is double an input frequency,
and
an active by-pass switch comprising a Field Effect Transistor (FET) and by-passing said
doubler circuit upon application of a switching gate voltage to said FET causing the output
frequency to be equal to the input frequency; and
a buffer amplifier outputting the reference signal having the reference frequency f_2 to said
first and second mixers,
wherein the output of said doubler is input to said buffer amplifier.

39. (Currently Amended) A transceiver comprising:
an intermediate frequency amplifier having an output;
a limiter having an output comprising a first frequency f_1 , said limiter comprising first active
inductive load circuit for providing a variable load, and wherein said first active inductive load
comprises one FET having a base connected to two capacitors, and wherein said first active
inductive load further comprises a FET diode;
a mixer having a first input comprising the output of said limiter and a second input com-
prising a reference frequency f_2 , said mixer comprising:

a mixer circuit which mixes the first and second inputs to produce an output having an additive frequency component f_+ and a difference frequency component f_- , where:

$$f_+ = f_1 + f_2,$$

$$f_- = \text{absolute value } (f_1 - f_2), \text{ and}$$

a second active inductive load which provides a variable load on said mixer circuit; and
an adaptive amplifier comprising an amplifier circuit and an active matching circuit which provides active matching at an input and output of said amplifier circuit,

wherein the output of said intermediate frequency amplifier is input to said limiter, and the output of said mixer is input to said adaptive amplifier.

40. (Previously Presented) A transceiver according to claim 30 or 38,
wherein the active by-pass switch comprises a MOSFET.

41. (Previously Presented) A transceiver according to claim 39,
wherein at least one of said first active inductive load and said second active inductive load comprises FETs.

42. (Previously Presented) A transceiver according to claim 39,
wherein at least one of said first active inductive load and said second active inductive load comprises MOSFETs.

43. (Previously Presented) A transceiver according to claim 36 or 37,
wherein at least one of said active inductive load, said first active inductive load, and said
second active inductive load comprises FETs.

44. (Previously Presented) A transceiver according to claim 36 or 37,
wherein at least one of said active inductive load, said first active inductive load, and said
second active inductive load comprises MOSFETs.

45. (Previously Presented) A transceiver comprising:
a first adaptive amplifier having an output comprising a first frequency f_1 , said amplifier
comprising amplification means and active matching means for providing active matching at an
input and output of said amplification means;

a first mixer having a first input comprising the output of said adaptive amplifier and a
second input comprising a reference signal having a reference frequency f_2 , said mixer
comprising:

mixing means for mixing the first and second inputs to produce an output having an addi-
tive frequency component f_+ and a difference frequency component f_- , where:

$$f_+ = f_1 + f_2,$$

$$f_- = \text{absolute value } (f_1 - f_2), \text{ and}$$

a first active load means for providing a variable load on said mixing means;

a first intermediate frequency amplifier,
wherein the output of said first mixer is input to said first intermediate frequency amplifier;
a second intermediate frequency amplifier having an output;
a limiter having an output comprising a third frequency f_3 , said limiter comprising a second active load means for providing a variable load;
a second mixer having a first input comprising the output of said limiter and a second input comprising the reference signal with frequency f_2 , said mixer comprising:
mixing means for mixing the first and second inputs to produce an output having an additive frequency component f_+ and a difference frequency component f_- , where:
$$f_+ = f_3 + f_2,$$
$$f_- = \text{absolute value } (f_3 - f_2), \text{ and}$$

a third active load means for providing a variable load on said mixing means;
a second adaptive amplifier comprising amplification means and active matching means for providing active matching at an input and output of said amplification means,
wherein the output of said second intermediate frequency amplifier is input to said limiter, and the output of said second mixer is input to said second adaptive amplifier;
a doubler having an output and comprising:
doubling means for outputting an output frequency which is double an input frequency,
and

an active by-pass switch comprising a Field Effect Transistor (FET) and by-passing said doubling means upon application of a switching gate voltage to said FET causing the output frequency to be equal to the input frequency; and

a buffer amplifier outputting the reference signal having the reference frequency f_2 to said first and second mixers,

wherein the output of said doubler is input to said buffer amplifier.

46. (Previously Presented) A transceiver comprising:

a first adaptive amplifier having an output comprising a first frequency f_1 , said amplifier comprising an amplifier circuit and an active matching circuit which provides active matching at an input and output of said amplifier circuit;

a first mixer having a first input comprising the output of said adaptive amplifier and a second input comprising a reference signal having a reference frequency f_2 , said mixer comprising:

a mixer circuit which mixes the first and second inputs to produce an output having an additive frequency component f_+ and a difference frequency component f_- , where:

$$f_+ = f_1 + f_2,$$

$$f_- = \text{absolute value } (f_1 - f_2), \text{ and}$$

a first active load which provides a variable load on said mixer circuit;

a first intermediate frequency amplifier,

wherein the output of said first mixer is input to said first intermediate frequency amplifier;

a second intermediate frequency amplifier having an output;

a limiter having an output comprising a third frequency f_3 , said limiter comprising a second active load for providing a variable load;

a second mixer having a first input comprising the output of said limiter and a second input comprising the reference signal with frequency f_2 , said mixer comprising:

a mixer circuit which mixes the first and second inputs to produce an output having an additive frequency component f_+ and a difference frequency component f_- , where:

$$f_+ = f_3 + f_2,$$

$$f_- = \text{absolute value } (f_3 - f_2), \text{ and}$$

a third active inductive load which provides a variable load on said mixer circuit;

a second adaptive amplifier comprising an amplifier circuit and an active matching circuit for providing active matching at an input and output of said amplifier circuit,

wherein the output of said second intermediate frequency amplifier is input to said limiter, and the output of said second mixer is input to said second adaptive amplifier;

a doubler circuit which outputs an output frequency which is double an input frequency,
and

an active by-pass switch comprising a Field Effect Transistor (FET) and by-passing said doubler circuit upon application of a switching gate voltage to said FET causing the output frequency to be equal to the input frequency; and

a buffer amplifier outputting the reference signal having the reference frequency f_2 to said first and second mixers,

wherein the output of said doubler is input to said buffer amplifier.

Please add the following new claims 47-49:

47. (New) A transceiver comprising:

a first adaptive amplifier having an output comprising a first frequency f_1 , said amplifier comprising amplification means and active matching means for providing active matching at an input and output of said amplification means;

a first mixer having a first input comprising the output of said adaptive amplifier and a second input comprising a reference signal having a reference frequency f_2 , said mixer comprising:

mixing means for mixing the first and second inputs to produce an output having an additive frequency component f_+ and a difference frequency component f_- , where:

$$f_+ = f_1 + f_2,$$

$$f_- = \text{absolute value } (f_1 - f_2), \text{ and}$$

active inductive load means for providing a variable load on said mixing means; and

a first intermediate frequency amplifier,

wherein the output of said first mixer is input to said first intermediate frequency amplifier;

a second intermediate frequency amplifier having an output;

a limiter having an output comprising a third frequency f_3 , said limiter comprising a first active inductive load means for providing a variable load;

a second mixer having a first input comprising the output of said limiter and a second input comprising the reference signal with frequency f_2 , said mixer comprising:

mixing means for mixing the first and second inputs to produce an output having an additive frequency component f_+ and a difference frequency component f_- , where:

$$f_+ = f_3 + f_2,$$

$$f_- = \text{absolute value } (f_3 - f_2), \text{ and}$$

a second active inductive load means for providing a variable load on said mixing means;

and

a second adaptive amplifier comprising amplification means and active matching means for providing active matching at an input and output of said amplification means,

wherein the output of said second intermediate frequency amplifier is input to said limiter, and the output of said second mixer is input to said second adaptive amplifier;

a doubler having an output and comprising:

doubling means for outputting an output frequency which is double an input frequency,
and

an active by-pass switch comprising a Field Effect Transistor (FET) and by-passing said doubling means upon application of a switching gate voltage to said FET causing the output frequency to be equal to the input frequency; and

a buffer amplifier outputting the reference signal having the reference frequency f_2 to said first and second mixers,

wherein the output of said doubler is input to said buffer amplifier.

48. (New) A transceiver comprising:

a first adaptive amplifier having an output comprising a first frequency f_1 , said amplifier comprising an amplifier circuit and an active matching circuit which provides active matching at an input and output of said amplifier circuit;

a first mixer having a first input comprising the output of said adaptive amplifier and a second input comprising a reference signal having a reference frequency f_2 , said mixer comprising:

a mixer circuit which mixes the first and second inputs to produce an output having an additive frequency component f_+ and a difference frequency component f_- , where:

$$f_+ = f_1 + f_2,$$

$$f_- = \text{absolute value } (f_1 - f_2), \text{ and}$$

an active inductive load which provides a variable load on said mixer circuit; and
a first intermediate frequency amplifier,
wherein the output of said first mixer is input to said first intermediate frequency amplifier;

a second intermediate frequency amplifier having an output;

a limiter having an output comprising a third frequency f_3 , said limiter comprising a first active inductive load for providing a variable load;

a second mixer having a first input comprising the output of said limiter and a second input comprising the reference signal with frequency f_2 , said mixer comprising:

a mixer circuit which mixes the first and second inputs to produce an output having an additive frequency component f_+ and a difference frequency component f_- , where:

$$f_+ = f_3 + f_2,$$

$$f_- = \text{absolute value } (f_3 - f_2), \text{ and}$$

a second active inductive load which provides a variable load on said mixer circuit; and

a second adaptive amplifier comprising an amplifier circuit and an active matching circuit for providing active matching at an input and output of said amplifier circuit,

wherein the output of said second intermediate frequency amplifier is input to said limiter, and the output of said second mixer is input to said second adaptive amplifier;

a doubler having an output and comprising:

a doubler circuit which outputs an output frequency which is double an input frequency,
and

an active by-pass switch comprising a Field Effect Transistor (FET) and by-passing said doubler circuit upon application of a switching gate voltage to said FET causing the output frequency to be equal to the input frequency; and

a buffer amplifier outputting the reference signal having the reference frequency f_2 to said first and second mixers,

wherein the output of said doubler is input to said buffer amplifier.

49. (New) A transceiver according to claim 47 or 48,
wherein the active by-pass switch comprises a MOSFET.